

Claims

1. A fuel injector for injecting fuel into a combustion chamber (23) of an internal combustion engine, having a pressure booster (3) whose booster piston (4) separates a work chamber (5), permanently subjected to fuel via a pressure source (1, 2), from a pressure-relievable differential pressure chamber (6), and a change in pressure in the differential pressure chamber (6) is effected via an actuation of a servo valve (24), which opens or closes a hydraulic connection (21, 39, 42) of the differential pressure chamber (6) to a low-pressure-side return (28), characterized in that the servo valve (24) has a servo valve piston (32, 65), which is guided between a control chamber (36) and a first hydraulic chamber (38) and on which an operative hydraulic face (44), constantly urged in the opening direction of the servo valve piston (32) by a system pressure, and a first sealing seat (40), which seals off the servo valve (24) from a low-pressure-side return (28), are embodied.
2. The fuel injector according to claim 1, characterized in that the control chamber (36) and the first hydraulic chamber (38) are subjected to system pressure via a supply line (29) that originates at the pressure reservoir (1).
3. The fuel injector according to claim 2, characterized in that the control chamber (36) of the servo valve (24) is subjected to system pressure, via a through conduit (33) extending through the servo valve piston (32), from the first hydraulic chamber (38) into which the supply line (29) discharges.
4. The fuel injector according to claim 3, characterized in that the through conduit (33) of the servo valve piston (32) includes an integrated throttle restriction (34).

5. The fuel injector according to claim 2, characterized in that the control chamber (36), via a second supply line portion (58) branching off from the supply line (29), and the first hydraulic chamber (38), via a supply line portion (58) branching off from the supply line (29), are subjected in parallel to system pressure.
6. The fuel injector according to claim 5, characterized in that the first supply line portion (57) includes a first throttle restriction (34).
7. The fuel injector according to claim 1, characterized in that the servo valve piston (32) has a first sealing seat (40), which opens or closes the low-pressure-side return (28), and a control edge (41), which separates the first hydraulic chamber (38) from a second hydraulic chamber (39).
8. The fuel injector according to claim 7, characterized in that the first sealing seat (40) is embodied as a flat seat or a conical seat and closes an outlet control chamber (42) located on the low-pressure side.
9. The fuel injector according to claim 7, characterized in that the control edge (41) is embodied as a slide sealing edge (43).
10. The fuel injector according to claim 1, characterized in that the differential pressure chamber (6), which can be pressure-relieved into the low-pressure-side return (28) via the servo valve (24), is hydraulically coupled with a control chamber (12) for an injection valve member (14), which control chamber receives a damping piston (51), and the damping piston (51) includes a throttle restriction (52) which defines the opening speed of the injection valve member, and the control chamber (12) for actuating the injection valve member (14) communicates via a filling line (56) with either the control chamber (12) or one of the hydraulic chambers (5, 6, 9) of the pressure booster (3).

11. The fuel injector according to claim 1, characterized in that the actuation of the servo valve (24) is effected via a switching valve (30) that connects the control chamber (36) to a return (31).
12. The fuel injector according to claim 1, characterized in that the servo valve piston (32) includes a reduced-diameter servo piston portion (65), on which a prestressed control sleeve (67) is received.
13. The fuel injector according to claim 1, characterized in that the control sleeve (67) together with the servo valve piston portion (65) forms a slide control edge (69).
14. The fuel injector according to claim 13, characterized in that the slide control edge (69) controls the communication with the low-pressure-side return (28).
15. The fuel injector according to claim 12, characterized in that the servo valve piston portion (65) of the servo valve piston (32) has first recesses (63), which include a slide sealing edge (43), which cooperate with a control edge (41) embodied toward the servo valve housing.
16. The fuel injector according to claim 12, characterized in that the control sleeve (67) is acted upon via a spring element (68), which is braced against a housing part (26) of the servo valve housing (25).
17. The fuel injector according to claim 12, characterized in that the servo valve piston portion (65) of the servo valve piston (32) includes first recesses (63) between the first hydraulic chamber (38) and the second hydraulic chamber (39) and second recesses (70) that form a slide seal (69).